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(21) Application No 8612316

(22) Date of filing 21 May 1986

(71) Applicant
Robert Ma
No 10-1 Lane 295, Sec 3 Chung King N Road, Taipei, Taiwan

(72) Inventor
Robert Ma

(74) Agent and/or Address for Service
Langner Parry, 52-54 High Holborn, London WC1V 6RR

(51) INTCL⁴
A61J 9/00

(52) Domestic classification (Edition I)
A5X 5E

(56) Documents cited
GB 0888217 US 3704803

(58) Field of search
A5X F2V
Selected US specifications from IPC sub-class A61J

(54) Feeding bottle regulator

(57) The regulator comprises a valve plate 7 having passages 72 therethrough, a slidable valve member 6 and a bypass passage 5 which connects with a tube 4. the regulator allows a child to feed when the bottle is in an upright or "bottom-up" position

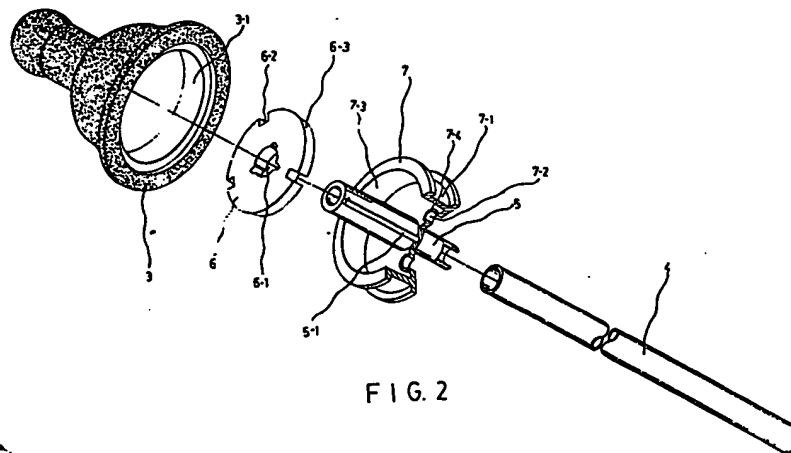


FIG. 2

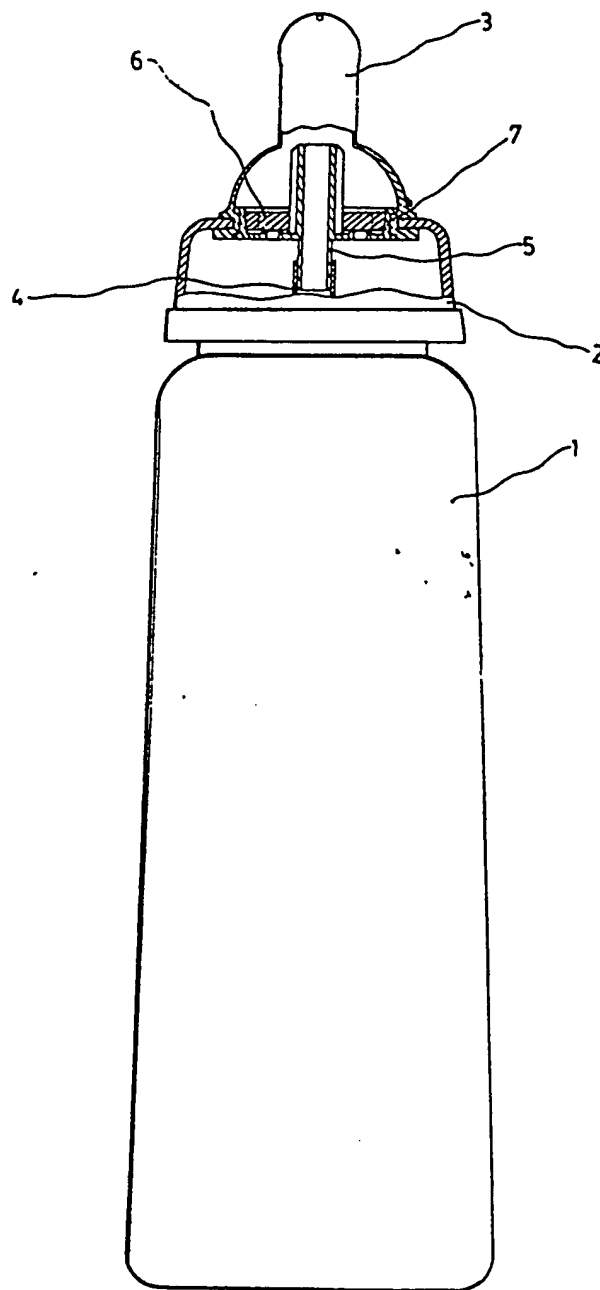


FIG. 1

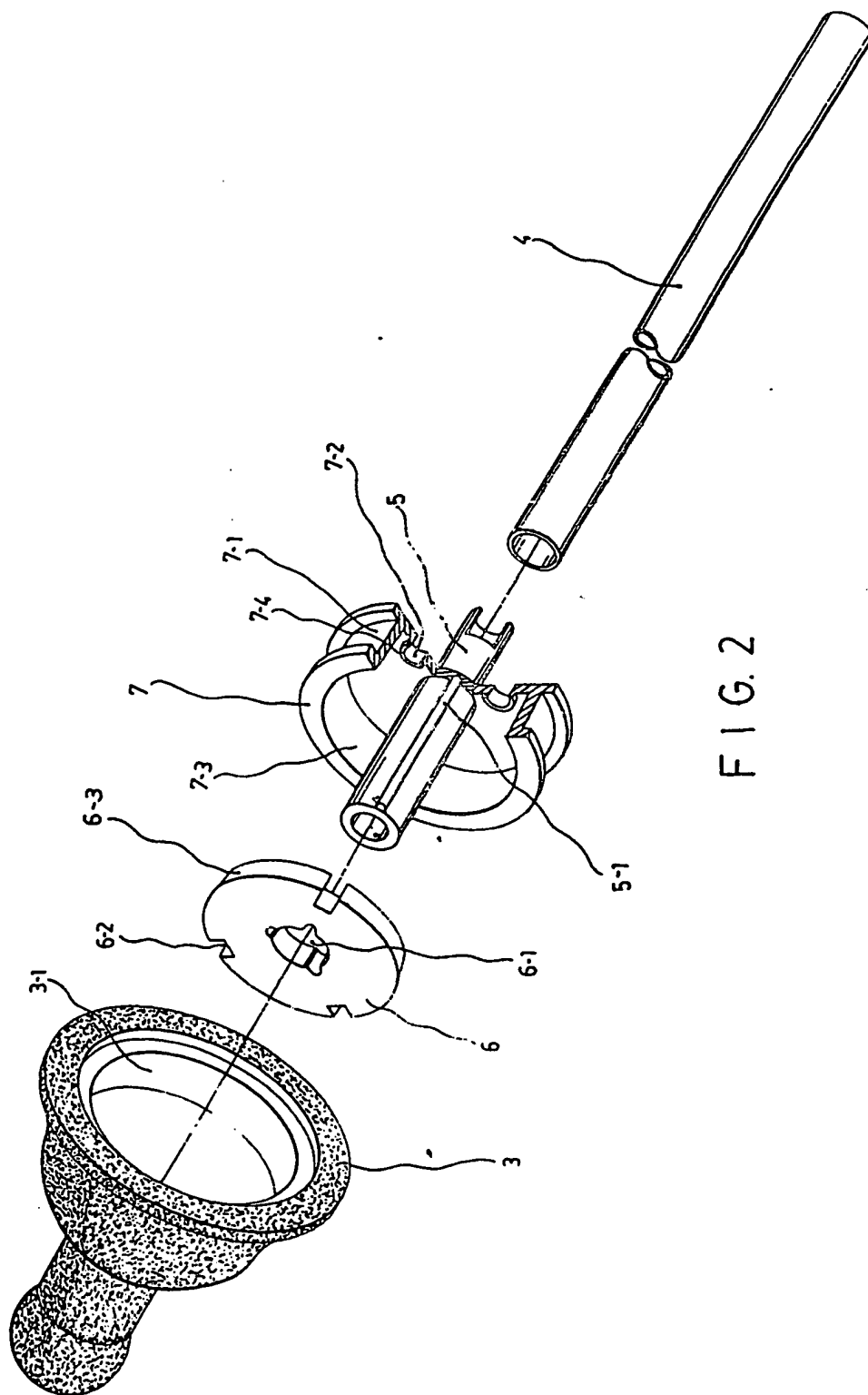


FIG. 2

SPECIFICATION

Feeding bottle with regulator

- 5 This invention relates to a regulator for a feeding bottle.
- The conventional feeding bottle, when used to feed a baby, has to be kept bottom-up or inclined at certain angle so that the baby can suck the milk into its mouth.
- 10 The baby can only suck air if the bottle is kept upright or less inclined which may cause the baby to become angry or even refuse; moreover when air collects in the stomach, the baby may have the hiccups, or regurgitate, not only making nursing harder work, but also wasting money, and affecting the health and
- 15 general comfort of the baby.

The invention, after thorough study and improvements, is to provide a regulator for the easy suction of milk no matter how the bottle is held. All the

- 20 difficulties such as introduction of air into stomach, regurgitation of milk, the hiccups, etc. can be totally avoided making nursing work easy and enjoyable.

- The regulator is to be provided inside the teat of a feeding bottle. Using a teat, milk can be sucked easily
- 25 by the baby into the mouth no matter what position the bottle is held even at its very upright position. The regulating device regulates the flow of milk when the bottle is bottom-up or at any downward angle. The baby can enjoy feeding without the risk of letting-in
- 30 air.

- According to the present invention there is provided a regulator for a fluid feeding bottle having a teat and a cap for securing the teat to the bottle, the regulator comprising a valve plate having passages there-
- 35 through, a movable valve member for opening and closing the said passages, bypass passage means for interconnecting opposite sides of the valve member and a suction tube arranged to communicate with the bypass passage and extend towards the bottom of a
- 40 bottle, wherein in use with a feeding bottle in an upright position with the teat uppermost a baby sucks fluid through the suction tube, bypass passage and teat, and with the feeding bottle with its bottom uppermost the baby sucks through the passages in
- 45 the valve plate, movable valve member and teat.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings, in which:-

- Fig. 1 is a cross-sectional view of a teat and regulator
- 50 of the invention on a feeding bottle, and

Fig. 2 is an exploded view of the teat and regulator according to the present invention.

- Referring to the drawings, there is shown in Fig. 1 a conventional feeding or nursing bottle comprising
- 55 bottle 1, a teat 2 and a nipple 3. The invention is to fix additionally a sucking tube 4, sucker joint 5, flow directing piston 6, and flow-directional control valve 7. By assembling all the parts as mentioned above, the baby can suck milk, without air, at any position at
- 60 which the bottle is held.

- The flow-directional control valve 7 mentioned above is a valve body of drum type, there is an annular slot 7-1 matching perfectly with an annular rib ring 3-1 inside the teat 3 so that the flow-directional control
- 65 valve 7 can fit tightly inside the teat 3.

- As shown in Figure 2, the outside peripheral circular surface of a flow directing piston 6 is designed with a tapered or cone surface 6-3 matching with an inner conical surface 7-3 of flow-directional control valve
- 70 when the at the bottom of the valve, there are passage holes 7-2 connecting flow passages 6-2 of the flow directing piston 6; the passage holes 7-2 have protrusions 7-4 directed toward piston 6, by which the parts 6 and 7 are spaced in the axial direction of the
- 75 sucker joint 5.

- The flow directing piston 6 is of innoxious plastics with a centering hole 6-1 alignable with positioning flange 5-1 of the sucker joint; the circumferential surface of the disk is designed with the passage 6-2, with the number of passages 6-2 being the same as the number of circular passages 7-2 of the flow-directional control valve 7 with their position shifted in order to avoid creating an air-tight situation.
- 80

- At the central position of flow-directional control valve 7, there is a sucker joint, which is circular in form at bottom end and is designed for the junction of sucking tube 4 which is arranged to extend straight to the bottom of the bottle body 1 with only a slight clearance for the suction of milk. The upper end of the
- 85 joint 5 is designed with two or three positioning splines 5-1 for the fitting and positioning of flow directing piston 6.

- When the bottle body 1 is at its up-right or approximate to the up-right position, the flow directing piston 6, due to its own weight, maintains
- 95 engagement with the protrusions 7-4 preventing milk passing through apertures 7-2 and keeps the outside conical surface 7-3 of the control valve 7. When the baby is sucking, the milk in the bottle can be sucked through the sucking tube and teat to the mouth. When the bottle is held at an inclined, or bottom-up position, the milk passes well through passage holes 7-2 and passages 6-2, lifting the directing piston 6 by flowing of the milk through passage holes 7-2 of control valve
- 100 7, to the mouth of the baby through the usual teat opening.

CLAIMS

1. A regulator for a fluid feeding bottle having a teat and a cap for securing the teat to the bottle, the regulator comprising a valve plate having passages therethrough, a movable valve member for opening and closing the said passages, bypass passage means for interconnecting opposite sides of the valve member and a suction tube arranged to communicate with the bypass passage and extend towards the bottom of
- 115 a bottle, wherein in use with a feeding bottle in an upright position with the teat uppermost a baby sucks fluid through the suction tube, bypass passage and teat, and with the feeding bottle with its bottom uppermost the baby sucks through the passages in the valve plate, movable valve member and teat.

2. A regulator as claimed in claim 1, wherein the bypass passage means comprises a hole in the valve plate and a tube extending from either side thereof.

3. A regulator as claimed in claim 2, wherein the valve member is maintained in a fixed orientation relative to the valve plate.

4. A regulator as claimed in claim 3, wherein the movable valve member has an aperture therein
- 130 through which protrudes one of the tubes extending

for the bypass passage.

5. A regulator as claimed in claim 4, wherein the said one of the tubes is splined and is received in a recess in the periphery of the aperture in the valve member.

6. A regulator as claimed in any of the preceding claims, wherein the valve plate is fixed to an annular collar the inner surface of which is tapered inwardly towards the valve plate, and the outer peripheral edge surface of the valve plate has a tapered surface matched to that of the inner surface of the annular collar for providing a seal therebetween when the valve member closes the passage in the valve plate.

7. A regulator as claimed in claim 6, wherein the valve member includes slots in the periphery thereof to allow the flow of fluid to the teat when the valve plate is spaced from the passages in the valve plate to open said passages.

8. A regulator as claimed in any one of the preceding claims, wherein the passages in the valve plate include protrusions extending outwardly from the valve plate towards the valve member.

9. A regulator for a nursing bottle, the regulating comprising: one flow directing piston, one sucker joint, and one sucking tube, of which, at the central position of bottom part of the flow directing valve, as mentioned above, there is a sucker joint which jointing the sucking tube, the outside circumferential surface of the control piston matches perfectly with the conical surface of the inner wall of flow directing valve, the center of the above-mentioned flow directing piston is designed with a hole with a key slot for positioning the protruding splines on joint.

10. A regulator as claimed in claim 9, wherein the outside surface of the circumference of directing piston of the regulating device has passages for the flow of milk and there are passage holes at the flow directing piston with protruding ridge which is designed for keeping apart the piston at an appropriate distance.

11. A regulator as claimed in claim 9, including a ring slot on the circumference of the drum type flow directing valve which can slide into the rib ring inside the teat.

12. A regulator substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.